

LIFE HISTORY NOTES ON THE LEAST TERN

BY IVAN R. TOMKINS

IT is amazing how one small mite of song in our vast complex of saline marshes, rivers and beaches, can mean so much. Absent, it is not missed, but when suddenly it is heard again after a time without it, one senses that something was missing before but now everything falls into proper perspective and there is order and beauty again—an order that is like a framework, incomplete in detail to let imagination have sway, yet comforting in its integrity. We may now and then fit some odd-shaped bit into the framework, to be tested by later observation. Fragments gleaned from the writings of others may tentatively bridge some of the gaps, yet there is always room for imaginative thought, controlled imagination fully heedful of possible errors in our own work, or in our interpretation of what others have written. The picture will always be incomplete, for however much we learn, there are still things to be added without end.

When April and May bring the cheery notes of the Least Tern (*Sterna albifrons*) creaking overhead, one more piece of the summer scene fits into place. Smallest of the terns, diminutive, elegant, immaculate in its white and gray and black plumage, it will dive for fishes close to our boat, drift directly overhead at close range, sit on the railings of bridges where cars pass frequently, or make its nest close to habitations or human activities if conditions suit. On the nesting grounds it will dive within a few feet of one's head, then return to the eggs while the intruder is only 50 feet away.

There have been two times when the species was numerous in this locality (Savannah, Georgia), once in the 1880's and again in the 1920's and '30's. There also have been two lows, the first within the years from 1890 to 1920, the second in 1957.

Erichsen (1921) stated that since 1891 no eggs of this species had been taken in Chatham County, Georgia, but quotes Troup D. Perry that they nested in large numbers on the five miles of sandy beach of Warsaw (Wassaw) Island from 1885 to 1890. Erichsen began the study of birds as a young man about 1909. Perry was then 59 years old. Gilbert R. Rossignol began his egg collections in 1904, and was active from 1907 to about 1937. All three were friends and competent observers.

From Rossignol's egg record it appears that he did not find any Least Terns nesting until his first visit to Oysterbed Island (he called it Robinson's Island) on June 7, 1922, but on that day he collected 55 sets of Least Tern eggs, and some sets of Wilson's Plover (*Charadrius wilsonia*) eggs. Oysterbed Island was not large enough above tidal level to furnish suitable habitat for a

large colony, until a few years before the 1922 visit. In the 1880's it did not exist.

These data are not extensive, yet the evidence of great fluctuations needs to be presented, not only for present understanding, but also to guide observations in the future. I wonder if similar things have happened in other parts of the range. About the turn of the century such things were usually blamed on the plume hunting. Perhaps other factors were operating too.

In the 1920's and 1930's, this species was very abundant along the coast of Georgia and South Carolina, and it was believed that it was making a strong comeback after the slaughter for millinery purposes was outlawed a few years before. Today this tern's numbers have fallen off greatly, and the reason is not at all clear. Certainly human predation is not now the cause. In 1925, by conservative estimate, 2500 pairs nested on Oysterbed Island in the Savannah River Entrance. This island was sandy, relatively barren of vegetation, and about 3000 feet by 6000 feet in dimension. As this is written in the late summer of 1957, I doubt if there are 200 pairs in Chatham County, and the small colonies under observation have not been successful in rearing replacements for the aging birds. About one-half of the possible tern habitat in the County was covered by me in April, May, and June, and trips were also made into portions of Sapelo Sound, and throughout the Altamaha Sound, farther south along the Georgia coast. Everywhere I have been the tale is the same, a few nonbreeders and a few small colonies of nesting birds.

In those early days on Oysterbed, there were some low dunes with an abundant population of *Rattus rattus*, all of the color phase we knew as the roof rat, and many house mice (*Mus musculus*). We never found definite evidence of predation on the terns or their neighbors, the Black Skimmers (*Rynchops nigra*) and the Wilson's Plovers. The chicken snake (*Elaphe obsoleta*) was also present, but no visible predation was noticed. The island was sufficiently isolated so that the mink (*Mustela vison*) and the raccoon (*Procyon lotor*) did not readily reach it. Avian predators were not greatly different from those today.

Oysterbed was built up by the dredging of spoil from the nearby channel, and, if left alone, vegetation soon made it untenable for the terns, skimmers and plovers, but the deposit of fresh sand renewed the habitat. About 1930 a hydraulic fill about three miles long was completed connecting Oysterbed with Jones Island, an 800-acre island to the westward which was largely salt marsh. This furnished a highway for numerous raccoons and minks which prowled the fill to and from the island nightly. Meanwhile, vegetation tended to extinguish the habitat. The birds took up habitation on clear ground at various points on the fill and appeared quite successful for several years, though there are no data on the number of young birds that reached the flying stage. In the

following years harbor improvements created barren sand heaps at various places along the harbor, and the terns and plovers moved sparingly onto these grounds. Small colonies of terns became established inland for about 20 miles, a few plovers nested as far as 15 miles from the Entrance, but the skimmers did not accept nesting grounds beyond the inner end of the fill.

The Mississippi Valley race (*Sterna albifrons athalassos*) nests on sandbars north to Sioux City, Iowa (DuMont, 1934), but our coastal race does not follow the river into the River Swamp. In recent years I have made several summer trips on the Savannah River from the Fall Line to Savannah, and would have seen the birds if they were present. There are numerous sandbars uncovered during the season of summer low water, and there are small fish near the surface for food.

After some time I became aware that these small tern colonies of 15 to 30 pairs were not very successful in their nesting. Some of the trouble was attributed to the Fish Crow (*Corvus ossifragus*), and it was thought that a small colony did not have an adequate defense, and that the attrition by the daily forays of the crows soon caused abandonment of the site. Many times these small groups of terns selected a site, made nests, and laid a few eggs; then after a little time their numbers began to lessen, and finally the site was deserted. In a colonial species like this, it may be that the mass stimulus of certain numbers is necessary before the birds can reach and maintain the proper emotional state for satisfactory nesting. It is not practical to detail here all of the shifting of populations and population centers from the late 1930's to date, even if adequate data were on hand, but now it seems that the decline started with the breakup of the large group on Oysterbed Island, or possibly a few years later when vegetation on the other side of the river began to inhibit nesting there. The last successful nesting of the skimmers at the Entrance was on Oysterbed in 1949, following the deposit of fresh sand in 1948, though it is not known how many young birds were reared. For the next two summers, 1950 and 1951, the skimmers and some Royal Terns (*Thalasseus maximus*) tried to establish a colony well up along the fill. In late May they assembled and prepared nests, but deserted the site by mid-June. At present I know of no skimmer colony in Chatham County.

Though there is clear evidence of a large decrease in numbers over the past 25 years, it cannot definitely be blamed on raccoon predation. This year one unsuccessful colony, whose eggs usually disappeared within a few days after they were laid, had raccoon tracks everywhere. Of all the vertebrates common to this area, the raccoon is the most probable one to have much effect on the terns where the ternery is close to the marshes. Trapping of fur-bearing animals was more intensive during the depression years, and has been less so

since about 1940, due to the fuller employment of those who would otherwise be trappers.

High tides and heavy squalls may also almost wipe out certain colonies. When a squall drops two or three inches of rain in an hour or so, the sand is easily eroded; eggs are buried or washed away; and even the immediate landmarks that may serve to orient the birds to the individual nests may be changed. Sometimes the terns will dig the sand out from around the partly buried eggs if they are left in place, and resume incubation, but if the eggs are separated by only a few inches, the bird will not roll them together again. Years ago there were small colonies on the outer beaches near the high water line, but these were vulnerable at times of high spring tide or storm tide.

Sprunt and Chamberlain (1949) give a glowing account of the prosperity of the Least Tern in the Charleston area. The finding of several small colonies is not evidence of adequate replacements, and I do not know how valid their account would be today, in the light of the status in Georgia. It probably would have been true some years ago.

When a species of relatively long life is declining in numbers due to poor success in the season of reproduction, the condition may not be noticed for some years. Gilbert R. Rossignol had one return of a banded bird at five years of age, and another at ten years. This is scant information as to longevity, but all that is at hand.

A few single birds are often seen foraging miles from any colony, and sometimes three to six pairs may take up on some suitable location, go through a part of the courtship activities, and perhaps even dig a few nest scrapes; but these are probably nonbreeders, perhaps too immature or for some other reason unable to carry through the full nesting cycle.

Timing of Arrival, Egg-laying.—The time of arrival in spring is quite consistent, about April 18 to 20. Courtship begins immediately, and appears to take about 20 days. The first eggs are usually laid about May 7, and from then on fresh eggs may be found at nearly any time up to about the middle of July. There is no indication of two broods; to my mind, the long period of feeding young (to be described later) precludes that. It appears instead that there is much destruction of eggs from one cause or another, even in a highly successful colony, and that the population consists of pairs of birds in various phases, psychologically and physically, of the regimen of the season of reproduction. It has been stated often that, when the nest or eggs are destroyed in any species, the pair goes back to some prior stage in the seasonal pattern. I have found some nests occupied for a week or more after the eggs disappeared, but in no case have I known fresh eggs to be laid there again.

By the end of July there may remain a few young birds still grounded, but most of them are awing, and the colony may be nearly deserted, the main body

of the terns moving to various beaches, sandbars, beds of dead oyster shell, and the like. The numbers diminish about September 1, and by the middle of the month all are gone. There are a few individual birds to be seen later, yet to my thought these few laggards are of little importance in the general scheme.

Courtship and Mating.—There is little indication of pair-formation when the spring migration occurs, but courtship is initiated soon after, and within a week the members of a pair seem to recognize each other by voice, for a resting female will often take off on hearing the notes of an approaching male. The courting grounds are quite independent of the nesting site, and may be miles away. Unlike the Common (*Sterna hirundo*), Gull-billed (*Gelochelidon nilotica*) and Royal Terns, all of which species are engaged in courtship activities when they pass through here in spring, the Least Tern prefers an elevated place near the river bank, rather than an open beach. An old log near the river, the piling tops of the river dikes, the concrete railing to bridges—these are the favored places. One spring the dredge, which was my office and home, worked close by some permeable dikes with flat-topped wooden pilings. For days the females sat on these pilings, apparently not fishing for themselves, accepting the food brought by the males who often mated with them there after the acceptance of some small fish or shrimp. Often a female would fly from her perch and there would ensue a series of flights, quite like the “fish flights” described by Palmer (1941) in the case of the Common Tern, but I have been unable to assign meaning to many parts that to his view seem significant, such as the “straight position,” the “bent position,” the “aerial glide,” the “parade,” and so on, though there is great similarity in his description to what takes place in this species.

Courtship feeding is one of the most significant parts of the courtship and is continued through the incubation period; though the complete ceremony which culminates in copulation and the ritual in general become abbreviated as the pair progresses into the median and later stages of the season of reproduction. Much has been written of courtship feeding, but it seems to me that too little emphasis has been given to the transition from the feeding during courtship to the feeding of the incubating female, and finally the bringing of food to the young brood. The symbolic offering of other objects has been mentioned in the literature, as the offering of sticks by the Black Skimmer (Pettingill, 1937). It is widespread among birds. The Osprey (*Pandion haliaetus*) will bring sticks to its incubating mate, who weaves them into the nest structure which becomes enormous in time. The Blue Jay (*Cyanocitta cristata*) brings nesting material and sits quietly nearby until its mate takes it to use in building the nest. The Herring Gull (*Larus argentatus*) in first winter plumage will pick up and carry around sticks, offering and refusing them to others in the flock. Perhaps the small bits of shell that ring the nest

of the Least Tern are such symbolic offerings. When the male brings a fish it may be passed back and forth between the pair a time or so before it is eaten.

The female signifies her readiness to mate by crouching and quivering her wings. The male stands beside or a little behind and turns his head rapidly to right and left for some time. The female also turns her head from right to left but not as much as the male. After mounting the female, the male continues the head-turning for a little time before copulation. The ceremony is distinctive, and has been seen many times.



FIG. 1. Male Least Tern carrying food to incubating female.

Incubation and Eggs.—The birds of the pair have been seen to relieve each other in incubating the eggs, yet it would not do to postulate equal sharing of this duty—if one may apply such a word—when the furnishing of a greater part of the food by the male in courtship, and probably later on, is considered. Certainly the male brings much of the food during some of the incubation period (Fig. 1). It can readily be observed in any colony at this time.

The eggs (size, color, etc.) have been well described in the standard works, and here it can only be pointed out that there is great variation in color, size of spots, etc., within the clutch of eggs. Some lack any warmth of color, others possess much of it. The downy young in the nest exhibit the same variation, some nearly pure gray and white, others with much reddish or brown in the coloration. It had been planned to photograph some variant sets in color, then follow through when the chicks were hatched to see if egg color and that of the downy plumage were related, but the lack of success of the 1956 season prevented this.

The habit of the incubating bird of leaving the nest, flying out over the water and plunging, then returning to shake off the water drops on the eggs, has been discussed elsewhere (Tomkins, 1942). Murbarger (1956) reported the same behavior in the White Pelican (*Pelecanus erythrorhynchos*). The loss of water from the eggs by evaporation might be considerable in very dry times. I have seen the American Oystercatcher (*Haematopus palliatus*) stand beside the nest and not cover the eggs in rain.

Foods and Feeding.—One habitat requirement is an ample supply of small fish or shrimp that swim close to the surface, for this species does not dive



FIG. 2. Least Tern bringing one fish to feed young.

deep nor accept large fishes. Though many thousands have been seen carrying food, it is doubtful if any of the fish have been much over 60 mm. long. When the large colony was nesting on Oysterbed Island, individual birds had a maximum range of 16,000 feet from which they carried food to the colony, though the food nearby was ample and daily replenished by the tides. The terns carry only one fish at a time (Fig. 2), mostly small slim fish of several species, and it must take a lot of flying, even at a median distance of one and a half miles, to satisfy the growing young (Fig. 3). On the other hand the Black Skimmer often feeds to the young fish or shrimp that are too long for the alimentary canal, and it is common to find a young bird with the tail of a fish sticking out of its mouth.

Though the Least Tern will now and then swoop down to the water surface and pick up a small fish between its mandibles, the normal way is to close the mandibles and spear the fish. Many of the fish discarded in the colony show punctures midway. Some years ago a Caspian Tern (*Hydroprogne caspia*) (Tomkins, 1934) was found with its mandibles stuck in the top of an old piling that was submerged at high tide. The mandibles were closed. Evidently

the tern had plunged at a fish, stuck its mandibles into the piling top and drowned. Plunging in the tern manner is sometimes indulged in by Bonaparte's Gull (*Larus philadelphia*), normally a dabbler, so the method of feeding is not confined to the terns.



FIG. 3. Least Tern 2½-3 weeks old; natal down being replaced by juvenal plumage.

Care of Young.—The things observed within the colony have not been enough different from published accounts for similar species to justify much comment. The young are known individually to the parents even though they wander considerably. When the young are able to fly and follow their parents, each adult, accompanied by one young bird, flies out over the water, plunges and catches a fish, then alights on the water and gives it to the young. Adults are still feeding young when they leave Georgia in September. When the young begin to feed for themselves is unknown. Both the Caspian and Royal Terns, neither of which nests in our immediate locality in any numbers, continue to catch food for the young until about November. These two species and the Least Tern frequently lay three eggs. Why then should one never see an adult followed by more than one young? At this stage the family does not seem to exist as such, but is separated into components of one adult and one young. One might assume that each adult cares for one individual young bird, and for that alone, but is this true? I have no answer at hand.

Even though the young birds, when fully fledged and competent in flight (Fig. 4), do not catch their own food for some time, there seems to be an inherited diving pattern. One day I came by a small borrow pit filled with

water about one foot deep, near a tern colony, and found a young Least Tern repeatedly diving into the pool. The pool had been made recently and had no tidal connection. It had been checked for small fish a couple of times recently. There was no sign that this bird was trying to catch fish, nor did it catch any



FIG. 4. Least Tern in juvenal plumage, able to fly.

while I watched the whole performance. The diving seemed to be play or practice, and at any rate it seemed to satisfy some inherent need in the young bird.

Palmer (1941:92), in his study of the Common Tern, has found such similarity in the feeding of the young when they are able to fly, that it deserves full quotation here: "Soon however, the juvenal begins to follow the parent on fishing trips. When following, it utters a high-pitched *ki-ki-ki-ki* and the adult responds with a *ki* or *kip* or *ke*, this last being a modified first part of the *ke-arr* of alarm. Chick and parent alternate rapidly in this calling. I have not been able to observe the transition from the stage of following the parents to the time when the young fish independently. Probably the Juvenals, which spend some time flying by themselves, sight fish in the water and instinctively dive for it.

"Prior to September 5, 1939, when I left the vicinity of the terneries, I had not seen a single juvenal catch a fish. . . ."

SUMMARY

The Least Tern arrives at the Savannah River Entrance, Georgia, in late April, nests and rears young, and leaves in early September.

Twenty-five to 30 years ago the species was numerous. Its numbers are now reduced to about 5 to 8 per cent of its former numbers, and recent nestings have not been very successful.

The reason may be a reduction of predator-free nesting grounds, but it is not certain.

The courtship and nesting habits are discussed briefly.

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